IN THE CLAIMS:

Claims 1-19 (*cancelled*)

20. *(currently amended)* A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts [[for]] that occur during each of at least two substantially distinct time slices occurring during the time period the source passes the apparatus; and

Calculating a correlation [[of]] among at least two of the measured radiation counts with respect to ~~either all of the at least two time slices or a subset of~~ the at least two time slices corresponding to the at least two measured counts.

21. *(currently amended)* The method of Claim 20 further comprising ~~where the correlation step is comprised of~~ calculating for each of the at least two time slices, the probability that the radiation counts [[in]] during the time slices came from background and determining whether all of the calculated probabilities are less than or equal to [[than]] a threshold value.

22. *(currently amended)* The method of Claim 20 further comprising ~~where the correlation step is comprised of~~ calculating for each of the at least two time slices, the probability that the radiation counts corresponding to the [[in the]] time slices came from background and determining whether for some integer n, ~~at least two~~ n of the calculated probabilities are less than or equal to a threshold value where the threshold value is selected as a function of the value of n and n is a number between and including 1 and the number of calculated probabilities.

23. *(previously presented)* The method of Claims 20, 21 or 22 where the measuring step detects the counts occurring within a pre-determined spectral window.

24. *(cancelled)*

25. *(currently amended)* A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts [[for]] that occur during each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

Calculating for each time slice within a subset of the plurality of time slices the probability that the radiation counts for the time slice came from background where the subset has at least two elements.

26. *(cancelled)*

27. *(currently amended)* The method of Claim 25 further comprising determining whether for some integer n, n [[at least one]] of the calculated probabilities corresponding to the time slices in the subset are less than or equal to a threshold value where n is a number between and including one and the number of elements in the subset.

28. *(currently amended)* The method of Claim [[25]] 27 further comprising [[determining]] selecting ~~whether all of the calculated probabilities corresponding to the time slices in the subset are less than or equal to a~~ the threshold value as a function of the number of n.

29. *(previously presented)* The method of Claim 25, 27 or 28 where the size of the subset is in the range from 1 to 1000.

30. *(previously presented)* The method of Claims 25, 27 or 28 where the counts are measured within a spectral window.

31. *(previously presented)* The method of Claim 30 where the spectral window is comprised of at least one energy channel.

32. *(currently amended)* A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by at least two detectors comprising the apparatus; and

Calculating a correlation [[of]] among the at least two of the measured radiation counts with respect to ~~either all of the at least two~~ the detectors ~~or a subset of the at least two detectors~~ corresponding to the at least two measured radiation counts.

33. *(cancelled)*

34. *(currently amended)* The method of Claim 32 where the correlation step is further comprised of calculating for each of the at least two detectors, the probability that the radiation counts from the detector came from background and determining whether for some integer n, [[at least one]] n of such calculated probabilities are less than a threshold value where n is a number between and including two and the number of calculated probabilities and the threshold value is selected as a function of n.

35. *(currently amended)* The method of Claims 32 [[, 33]] or 34 where the measurement step detects radiation counts within a pre-determined spectral window.

36. *(previously presented)* The method of Claim 35 where the spectral window is comprised of at least one energy channel.

37. *(currently amended)* A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by a plurality of detectors comprising the apparatus; and

Calculating for each detector within a subset of the plurality of detectors the probability that the radiation counts for that detector came from background.

38. *(previously presented)* The method of Claim 37 where the subset size is between 1 and the number of detectors in the plurality.

39. *(currently amended)* The method of Claim 37 further comprising determining whether for some integer n, n ~~, at least two~~ of the calculated probabilities corresponding to the detectors in the subset are less than [[the]] a threshold value where n is a number between and including 2 and the number of elements in the subset.

40. *(currently amended)* The method of Claim ~~37~~ 39 further comprising selecting ~~whether all of the calculated probabilities corresponding to the detectors in the subset are below a~~ the threshold value as a function of the number n.

41. *(previously presented)* The method of Claim 37, 39 or 40 where the size of the subset is in the range from 1 to 1000.

42. *(previously presented)* The method of Claims 37, 39 or 40 where the counts are measured within a spectral window.

43. *(previously presented)* The method of Claim 42 where the spectral window is comprised of at least one energy channel.

44. *(previously presented)* The method of Claim 42 where the spectral window is comprised of between 1 and 255 energy channels.

45. *(currently amended)* The method of Claim 42 where the number of energy channels used in the spectral window is determined by measuring the e^{-1} peak width as a function of peak channel number where e is the base of the natural logarithm.

46. *(currently amended)* A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring in each of [[the]] at least two detectors comprising the apparatus the individual approximate number of radiation counts during each of at least two substantially distinct time slices occurring approximately during the time period the source passes the apparatus; and

Calculating a first correlation [[of]] among [[the]] at least two measured radiation counts with respect to their corresponding ~~a subset of the at least two~~ time slices ~~together with~~ and a second correlation among the at least two measured radiation counts with respect to their corresponding ~~subset of the at least two~~ detectors.

47. (*currently amended*) The method of Claim [[20]] 46 where the correlation step is further comprised of determining whether for some integer pair n,m [[the]] [[number]] n of the detected radiation counts [[in]] corresponding to the at least two of the time slices is greater than or equal to a first threshold and m of the detected radiation counts corresponding to the at least two detectors is greater than or equal to a second threshold.

48. *(currently amended)* The method of Claim [[32]] 47 where the correlation step is further comprised of [[determining]] selecting ~~whether the number of detected radiation counts in at least two of the detectors is greater than or equal to a~~ the first threshold and the second threshold as a function of the integer pair n,m.

49. (*currently amended*) ~~The method of Claim 27~~ A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts for each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

~~where there is no calculating of probabilities step,~~ and [[the]] determining [[step is]] whether ~~at least two of~~ for some integer n, n of the radiation counts corresponding to the plurality of time slices ~~the subset~~ are greater than or equal to a threshold, where the number n is greater than or equal to two and less than or equal to the number of time slices.

50. (*currently amended*) The method of Claim [[28]] 49 where ~~there is no calculating of probabilities step, and~~ the determining step is further comprised of selecting the ~~whether all of the radiation counts corresponding to the subset are greater than or equal to a~~ threshold as a function of the number n.

51. (*currently amended*) ~~The method of Claim 39 where there is no calculating of probabilities step,~~
A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by a plurality of detectors comprising the apparatus during the period of time the source passes the apparatus;

and [[the]] determining [[step is]] whether ~~at least two~~ for some integer n, n of the radiation counts corresponding to the [[subset]] plurality of detectors are greater than or equal to a threshold, where the number n is greater than or equalt to two and less than or equal to the number of the plurality of detectors.

52. (*currently amended*) The method of Claim [[40]] 51 where ~~there is no calculating of probabilities step, and~~ the determining step is ~~whether all of the radiation counts corresponding to the subset are greater than or equal to a~~ further comprised of selecting the threshold as a function of the number n.

53. (*currently amended*) The method of Claim 20 where the correlation step is further comprised of calculating for each of the at least two time slices or a subset of the at least two time slices, the probability that the radiation counts in each time slice is from a source and determining whether the at least two or the subset of the at least two of the calculated probabilities are greater than or equal to a threshold.

54. (*currently amended*) The method of Claims 32 where the correlation step is further comprised of calculating for each of the at least two detectors, the probability that the radiation counts from each detector is from a source and determining whether at least two of the calculated probabilities are greater than or equal to a threshold.

55. *(cancelled)*

56. (*cancelled*)

57. (*cancelled*)

58. (*cancelled*)

59. (*currently amended*) The method of Claims 21, 22, 27, 28, 34, 39, 40, 49, 50, 51 or 52 [[or 39]] where the threshold is between 10^{-4} and 10^{-8}.

60. (*currently amended*) The method of Claims 21, 22, 27, 28, 34, 39 or 40, 49, 50, 51 or 52 [[22 or 40]] where the threshold value is between 10^{-7} and 10^{-11}.

61. *(currently amended)* The method of Claims 20, 21, 22, 25, 26, 27, 47, 49, 50 [[,]] or 53 [[, 55 or 56]] where the time slices are between about .05 seconds and 1 second in width.

62. *(currently amended)* The method of Claims 20, 21, 22, 25, 26, 27, 47, 49, 50 [[,]] or 53 [[, 55 or 56]] where the time slice durations are less than about one-half of the time period.

63. *(currently amended)* An apparatus for detecting low-level radioactive sources moving past the apparatus comprising:

At least one detector that generates a radiation count [[an electrical signal]] as a result of its detection of a radiation event [[count]];

At least one analyzer, operatively coupled to the detector, where the analyzer determines the approximate number of radiation counts corresponding to each of at least one energy channel during at least one substantially distinct time slice during the approximate time period that the source passes the apparatus; and

At least one control computer operatively connected to the at least one analyzer where the control computer contains in its internal memory a computer program that uses the detected counts as data and alerts a hit when the program calculates a [[high degree of]] correlation

among the ~~detected~~ generated counts with respect to [[for]] a subset of either the at least two detectors or the at least two time slices or both that is consistent with a radiation source where such subset has at least two elements.

64. *(previously presented)* The apparatus of Claim 63 where the computer program calculates the probabilities for a spectral window comprised of at least one energy channel.

65. *(currently amended)* The apparatus of Claim 63 where the detectors are comprised of either cesium iodide or high-purity germanium or both.

66. (*currently amended*) An apparatus for detecting low-level radioactive sources moving past the apparatus comprising:

At least one detector that generates a radiation count [[an electrical signal]] as a result of its detection of a radiation event [[count]];

At least one analyzer, operatively coupled to the detector, where the analyzer determines the approximate number of radiation counts corresponding to at least one energy channel during at least one substantially distinct time slice during the approximate time period that the source passes the apparatus; and

At least one control computer operatively connected to the at least one analyzer where the control computer, when operated in the apparatus, causes the apparatus to perform the methods claimed in any one of Claims [[20 to 62]] 20, 21, 22, 25, 26, 27, 28, 32, 34, 37, 38, 39, 40, 46, 47, 48, 49, 50, 51, 52, 53 or 54.

67. *(currently amended)* A medium for storing digital data having a computer program recorded thereon, such that when the program is loaded onto a computer and run, the computer will, when operatively connected to at least one analyzer that is operatively connected to at least one detector, execute the methods as claimed in any one of Claims [[20 to 62]] 20, 21, 22, 25, 26, 27, 28, 32, 34, 37, 38, 39, 40, 46, 47, 48, 49, 50, 51, 52, 53 or 54.

68. (*new*) The method of Claim 46 where the correlation step is further comprised of calculating for each of the at least two detectors for each of the at least two time slices, the probability that each measured count corresponding to the detector during the time slice came from background.

69. (*new*) The method of Claim 68 further comprising, determining whether for some integer pair n,m, n of the calculated probabilities for any of the at least two detectors during any time slice is below a first threshold and m of the calculated probabilities for any of the time slices corresponding to any detector is below a second threshold.

70. (*new*) The method of Claims 49, 50 or 51 where the threshold is between and including one count and twelve counts.

71. *(new)* A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts that occur during each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

Calculating for each time slice within a subset of the plurality of time slices the probability that the radiation counts for the time slice came from a radiation source where the subset has at least two elements.

72. *(new)* The method of Claim 71 further comprising determining whether for some integer n, n of the calculated probabilities corresponding to the time slices in the subset are greater than or equal to a threshold value where n is a number between and including one and the number of elements in the subset.

73. *(new)* The method of Claim 72 further comprising selecting threshold value as a function of the number of n.

74. (*new*) The method of Claim 72 where the threshold value is between approximately .99 and 1.